

An agricultural practice as a direct threat to the snake-eyed skink *Ablepharus kitaibelii* (Bibron & Bory de Saint-Vincent, 1833) in central Greece

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Abstract

Terrestrial reptiles are threatened by numerous anthropogenic activities, including agriculture. Many agricultural methods and techniques affect the herpetofauna located in the oldest known tree crops in the Mediterranean Basin, olive trees. For the first time, we present a case of unintentional capture (and killing) of 12 snake-eyed skinks *Ablepharus kitaibelii* (Bibron & Bory de Saint-Vincent, 1833) on an insect control sticky trap in an olive grove in central Greece.

Key Words

agriculture, lizard, Mediterranean, olive grove, sticky traps, threat

Agriculture represents one of the most common threats to terrestrial reptiles (74% of threatened reptilian species affected) on a global level (Böhm et al. 2013). In the case of lizards, agricultural methods, such as pesticides or insecticides, have been reported to severely affect lizards' populations (DuRant et al. 2007; Amaral et al. 2012). Olive tree cultivation, one of the oldest known tree crops in the Mediterranean Basin (Loumou and Giourga 2003; Connor 2005), is not an exception. Most of the Mediterranean countries maintain a considerable amount of olive tree cultivations to produce either olive oil or edible olives. Though olive groves are not considered a fragile type of cultivation, they do suffer from certain pests. Amongst the latter, the olive fruit fly *Bactrocera oleae* (Rossi, 1790) stands out. To control this particular insect, but also other pests, several methods have been developed, including the sterile insect technique, alternative natural phytosanitary insecticides, particularly organophosphates, hydrolyzate protein solution and

pheromones and sticky traps (Mazomenos et al. 2002; Skouras et al. 2007).

Sticky traps are known from both agriculture and also scientific research. They are hung from tree branches or directly attached on tree trunks to trap insects (and other animals) on their sticky surface. Thanks to their efficiency, low cost and ease of setting up, they quickly become an effective and widely-used tool to trap insects. As sticky traps can effectively capture lizards as well, they are, therefore, also used in herpetological studies (Glor et al. 2001; Ribeiro-Júnior et al. 2006, 2008). Here, we report a case of unintentional lizard capture (and killing) in an olive grove in central Greece.

On 1 June 2019, a sunny day with average temperature of 28 °C, we made a herpetological excursion to the Spercheios River valley (Fthiotida, central Greece; 38.9022°N, 22.2775°E). While searching for reptiles in an olive grove (elevation 65 m), we spotted a sticky trap in the ground that had fallen from an olive tree where



Figure 1. **A.** A sticky trap in use, hung from a tree; **B.** The first sticky trap found on the ground with a trapped dead adult *Ablepharus kitaibelii* (notice the arrow).

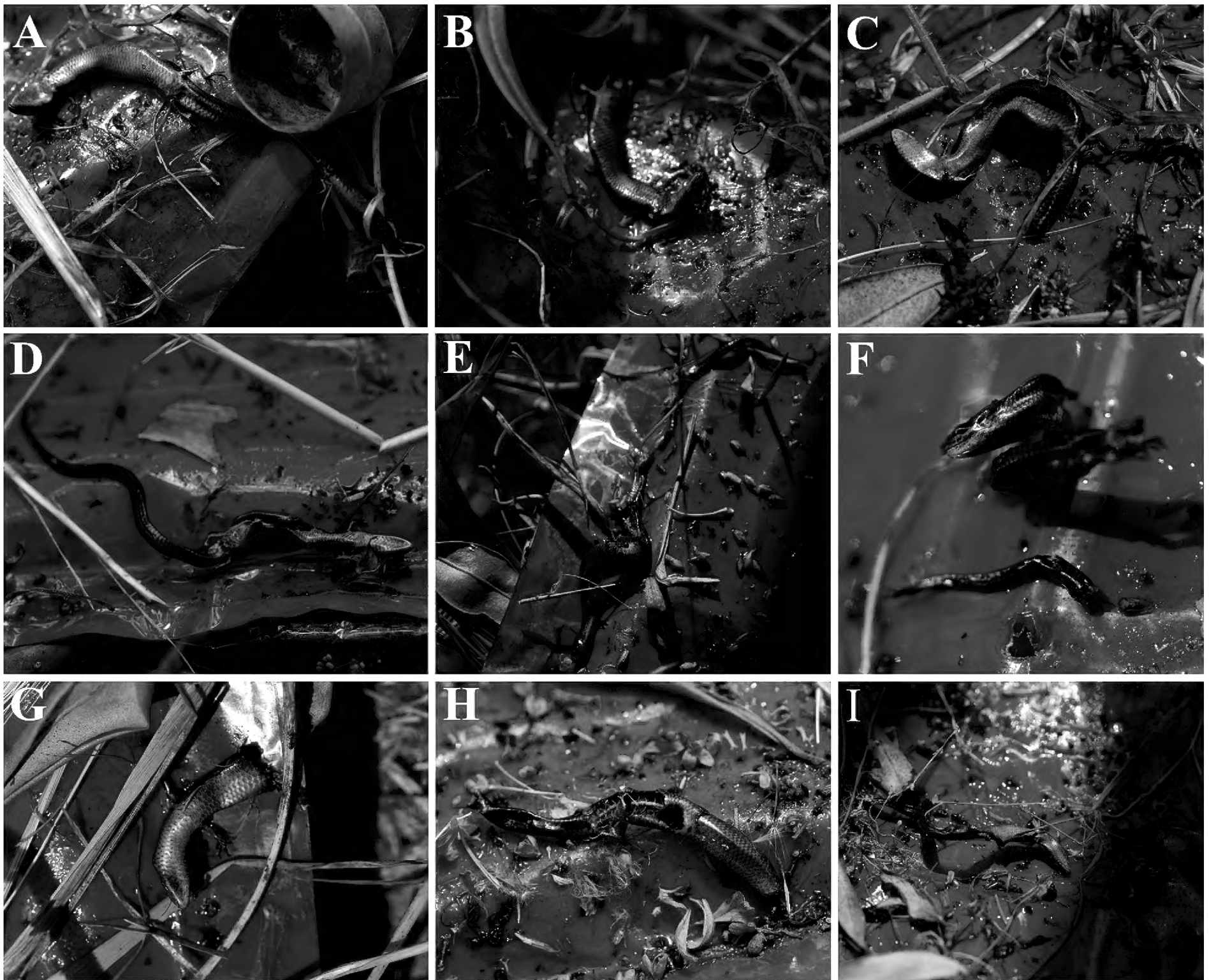


Figure 2. (A.–I.) Dead individuals of *Ablepharus kitaibelii* on several sticky traps.

more traps were still in place, hanging from the tree branches (Fig. 1A). To our surprise, a snake-eyed skink *Ablepharus kitaibelii* (Bibron & Bory de Saint-Vincent, 1833) already dead, was found stuck to the underside of the trap (Fig. 1B). During our stay in the olive grove, we spotted a total of 11 sticky traps which had fallen from the olive trees. In eight of them, we encountered 12 dead adults *A. kitaibelii*: six individuals were found on two traps and one individual was found on each one of the other six traps (Fig. 2A–I).

The snake-eyed skink is a small terrestrial lizard that lives on the ground hiding in dense grass vegetation, incapable of climbing trees (Herczeg et al. 2007; Valakos et al. 2008). It is a common species in olive groves and, as it ranges throughout Greece, including most of the islands (Valakos et al. 2008), sticky traps in olive trees represent a serious danger. Most probably some individuals ended up on the sticky traps after the traps had fallen on the ground. It is hard to tell whether the skinks were attracted by the trapped insects or they sought shelter under the fallen sticky traps. In either case, they were captured on the sticky surface and, eventually, died.

To the best of our knowledge, this is the first report of dead lizard individuals due to insect control sticky traps used in olive groves. The number of our observations indicates that these lizard-killing incidents may be common in olive groves. In Greece, olive groves occupy some 887,000 hectares (second largest olive grove area after Spain in the European Union). Approximately 10,650,000 hectares of olive groves are cultivated worldwide (FAOSTAT 2016). In other words, many small-bodied lizards, like *A. kitaibelii* or geckos that climb on olive tree trunks, like *Mediodactylus kotschy* (Steindachner, 1870) (Swartz et al. 2016; Pafilis et al. 2020) or even juveniles of other larger lizards, are potentially jeopardised by this practice. Interestingly, in this case, we found exclusively *A. kitaibelii* and no other lizard that also dwells in the area. More systematic research on the topic that will include other olive-producing countries and more lizard species could show the exact scale and the extent of this problem. As a first step, farmers should regularly check that sticky traps remain on the trees and immediately collect traps from the ground.

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